Greetings,

First of all, please allow the editor to say that he is sorry for the delay in getting this issue to you. You see, in between our last meeting and Rainbow Fest alot has happened in this household...It's amazing just how a little baby can keep you from your duties. Again, sorry guys!

LAST MEETING IN REVIEW

There were three product presentations during our last meeting. If you missed them...Too bad, they were great! John Keller reviewed CoCo Paint using the X-Pad. CoCo Paint is yet another graphic software program. Where it is not CoCoMax, it is a close second and at half the price. Ed Hathaway gave a brief showing of a new video digitizer called VIDX by Grafx. Once again a close second to Micro Works DS-69, but at a far less cost. Closing out the meeting, Tony Podraza tryed to show us how to burn a ADOS chip. Due to a bad tape copy of the customized ADOS, the presentation was cut short...Sorry Tony!

JULY MEETING INFORMATION

For the July meeting, I'm sure there will be a product presentation, but at this mailing, one has not been arranged. We will however, be hearing about a very important protection program for all of your software/hardware. If for nothing else, don't miss this information.

TIB-BITS

Attached with this newsletter is a complete listing of the CoCo's memory locations. I believe you will find this information handy in allot of ways. It was published in the December '83 issue of MICRO and is reprinted with-out permission, so mom's the word!!!

OUTSIDE WORLD

Coming soon will be the Commodore 128. Having read a great deal about this new system, this is the low-down. This system will use an upgraded basic called BASIC 7.0 and in 80 columns. It's disk operating system will be CP/M Plus (3.0) with a beige screen (not blue). There will be a throw switch to boot their 64 mode, thus, staying fully compatible with existing software. Commodore claims that this systems separate 64, 128 and CP/M operating modes offer features that would be considered standard on most machines but were lacking on the 64 - including a faster drive (the 1517), 80-column display (on the new 1902 monitor) and memory expansion up to a 512K total. No prices have been set for the 128 of peripherals, yet, according to experts, expect to see it at around \$1000 (this price will include all of the above). Commodore feels that using CP/M, it will bring this system into the business world of computers.

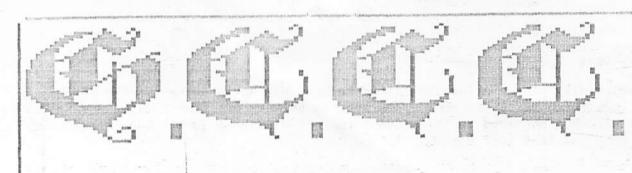
Footnote: At the price of this NEW system, check out Tandy's 1000. MS-DOS, disk drive, 128K, etc., etc...with a sale price of \$999.95. NOW, how has the edge!!!

CLOSING NOTES

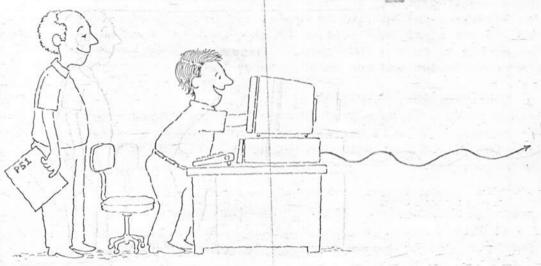
Remember, July 11th is our next meeting. For the new guys and guests, we meet at the Glenside Public Library on Fullerton Road in Glendale Heights. Our meetings start around 7:30pm and run no latter then 10:00pm. Hope to see you all there in coccheaven! Oh, the Glenside Color Computer Club is doing a road show at the Glendale Heights Founders Day party. Details at our July meeting.

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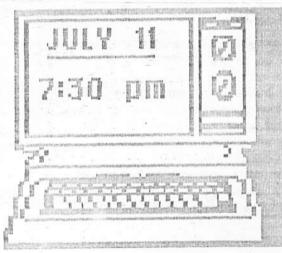
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Glenside Color Computer Club



Profile Artisch Simulator



NEXT CLUB MEETING





Radio Shack Color Computer Memory Map



	(All Numbers i	in Hex)	0062	E
	-1-0		0068-0069	C
	37.77	Overview	006C	C
	0000-03FF	Ram used by BASIC Interpreter	006F	D
	0400-05FF	Video Display (May be moved)	0001	10
	0600-0FFF	RAM for user program		1-
	1000-3FFF		0070	E
	4000-7FFF	Additional RAM in 32K system	0071	R
	8000-9FFF	Extended BASIC ROM	0072-0073	R
	A000-BFFF	Basic Interpreter ROM	0072 0070	\$8
	COOO-FEFF =	Cartridge ROM	0074-0075	Pe
4	FF00-FFFF	I/O and Control	0078	Fi
			007.0	0
		Extended	0079	T
	0003	General Counter	007A-007B	Т
	0006	String Flag	007C	T
	0007	Flag if Garbage Collected	00,0	1
	0019	Start of User RAM	007D	N
	0019-001A	BASIC Program Begin	00,2	I/
	0019-001A	Pointer to Top of Program/Begin	007E-007F	P
	001B-001C	Variables	00.200.2	C
	001D-001E	Pointer to Top of Variables/Start of	0080	C
	COID-OOIL	Arrays	0081	C
8	001F-0020	Pointer to End of Arrays/Start of	0082	G
	0011-0020	Available Memory	0083	·P
Ť	0021-0022	Top of Stack/Start of String Pool	0084	R
	0023-0024	Start of Used Area of String Pool	0085	L
	0025-0024	Pointer to BASIC Memory Limit	0087	L
	0027-0028	End of String Pool/Start of User Space	0088-0089	P
	0033-0034	Pointer to Current Data Read Position	008A-008B	S
	0037-0038	Current Variable Name	008C	S
	0041	4 Bytes Used by Tokenize	008D-008E	D
	0041-0048	Start and End Address of Block Move	008F	S
	0041	Highest Address to Move to	0092	C
	0043	Highest Address to Move		C
	0045	Lowest Address Moved to	0094	C
	0047	Lowest Address to Move	0095-0096	1
	0047	Highest String Found		C
	004B	Address of Descriptor of Highest	0097-0098	-C
		String Found		\$
	004F-0054	Floating Point Accumulator #1	0099	C
	TOP OF THE PARTY O	161-1-1	OOOA	T

0062	Sign Comparison
0063	Extended Precision Byte
0068-0069	Current Program Line
006C	Current Column Position
006F	Device Number for Output Character
000.	(0 = Screen, \$FE = Printer, \$FF = Tape,
	1-16 = Disk BASIC File#)
0070	EOF on Tape File Flag
0071	Reset Flag = \$55 for Warmstart
0072-0073	Restart Pointer (contains
	\$80C0-BASIC Warmstart
0074-0075	Pointer to End of Memory
0078	File Mode (0 = None, 1 = Input, 2 =
	Output) Mal
0079	Tape Working Buffer Length
007A-007B	Tape Working Buffer Pointer
007C	Tape File Block Type (0 = Header,
00.0	1 = Data, SFF = EOF)
007D	Number of Data Bytes in Cassette
0012	I/O Block
007E-007F	Program End Address 1 after a
1	CLOADM
0080	Checksum
0081	Cassette Error #
0082	General Counter
0083	Pulse Width Count
0084	Rise/Fall Flag
0085	Last Sine Value
0087	Last Key Entered
0088-0089	Pointer to Current Cursor Position
008A-008B	Serial Read # of Tries
008C	Sound Frequency
008D-008E	Duration of Sound
008F	Start of Area Downloaded from ROM
0092	Controls Length of Unmodulated
	Carrier Preceeding Casette I/O
0094	Cursor Color
0095-0096	High and Low bytes of Baud Rate
	Code (Normally \$0057)
0097-0098	Carriage Return Delay (Normally
	\$0001)
0099	Comma Field Width (Normally \$10)
009A	Last Comma Field (Normally \$70)
009B	Printer Line Width (Normally \$84)
009C	Affects positions of Vars. Line-printed

in Comma Fields (\$00)

005C-0061

(6 bytes) String Length

16 bytes!

Floating Point Accumulator #2

TRS-80C:			
009D-009E	Transfer Address after CLOADM	014E-014F	Address for USR8
009F	Start of get next character subroutine	- 0150-0151	Address for USR9
00A5	Start of get same character subroutine	0152-0159	Keyboard Rollover Table
00A6	Next Character Pointer	015A-015D	Joystick Readings
00A8-00AA	Jump Vector to Print OK	015A	Left Joystick Up/Down
OOAB-OOAE	Extended Product Area	015B	Left Joystick Left/Right
OOAF	Trace Flag	015C	Right Joystick Up/Down
00B5	Current Color	015D	Right Joystick Right/Left
0086	Current PMODE	015E-0160	Open Device Hook Called at
00B7-00B8	End of Screen1	The second secon	\$A5F6/Set to \$C426 by Disk
00B7 00B0	Number of Bytes per Line	0161-0163	Device Number Check Called at
00BA-00BB	Address of Graphics Page		\$A5B9/Set to \$C838 by Disk
00BC	\$E = Disk system,\$6 = No disk	0164-0166	Return Device Parameters Called at
00BD	X1 X4		\$A35F/Set to \$C843 by Disk
OOBF	YI	0167-0169	Character Output Called at
	Color Set 1 = 8		\$A282/Set to \$8273 by Extended/Set
00C1	X2		to \$CB4A by Disk
00C3	The state of the s	016A-016C	Character Input Called at \$A176/Set
00C5	Y2	010110100	to \$BCF1 by Extended/Set to \$C58F
00D7	Temp	1 3 1	by Disk
OODB	Change Flag	016D-016F	Check File OPEN for Input Called at
00E6	DLOAD Baud Rate	01010-0101	\$A3ED/Set to \$C818 by Disk
00E7	Input Timeout Constant	0172 0175	
00EA	Operation Code	0173-0175	Close All Open Files Called at
OOEB	Drive Number		\$A426/Set to \$CA3B by Disk
OOEC .	Track	0176-0178	Close One File Called at \$A42D/Set
00ED	Sector Sector		to \$8286 by Extended/Set to \$CA4B
OOEE	Buffer Address		by Disk
00F0	Status Returned	0179-017B	Print Using Called at \$B918/Set to
0100-0102	Software Interrupt 3 Called by Vector		\$8E90 by Extended
4 1 3 3 5 5 5 5	at \$FFF2	017C-017E	File Item Scanner Called at
0103-0104	Software Interrupt 2 Called by Vector		\$B061/Set to \$CC5B by Disk
0100 0101	at SFFF4	017F-0181	- Break Key Check Called at \$A549/Se
0105-0108	Software Interrupt 1 Called by Vector		to C859 by Disk
0103 0100	at SFFFA	0182-0184	Get Line From Keyboard Called at
0109-010B	Non-Maskable Interrupt Called by		\$A390/Set to JMP RTS by Disk
0107-0101	Vector at \$FFFC Set to \$D7AE by	0185-0187	
	Disk	0100 010	\$A4BF/Set to \$CA36 by Disk
010C-010E	Interrupt Request Called by Vector at	0188-018A	
010C-010E	\$FFF8 Set to \$A9B3/Set to \$894C by	0100 01011	\$A5CE/Set to \$C860 by Disk
		018B-018D	
0.000.0111	Extended/Set to \$D7BC by Disk	010B-010D	- \$B223/Set to \$8846 by Extended/Set
010F-0111	Fast Interrupt Vector Called by Vector		to \$CDF6 by Disk
	at \$FFF6/Set to \$A0F6	0105 0100	
0112-0113	High and low bytes of TIMER	018E-0190	User Error Called at \$AC46/Set to
0116-0117	Seed for RND Function		JMP RTS by Disk
011A	Shift Lock Flag	0191-0193	
011C	Keyboard Delay Constant	1900-20100 2010200	by Extended/Set to \$C24D by Disk
011D-011F	Jump vector to \$8489-Print OK	0194-0196	Run Called at \$AE75/Set to \$829C b
0120-013C	Token Table Directory(Byte 1 = # of		Extended/Set to \$C990 by Disk
	Keywords, Byte 2,3 = Address of Table,	0197-0199	Hex & Octal Called at \$BD22/Set to
1	Byte 4,5 = Address of Subroutines)		\$87E5 by Extended
0120-0124	BASIC Commands	019A-019C	Execute Line Called at \$AD9E/Set to
0125-0129	BASIC Functions		\$82B9 by Extended
012A-012E	Extended BASIC Commands	019D-019F	Graphics Address Called at \$A8C4
012F-0133	Extended BASIC Functions	01A0-01A2	CLS, GET, PUT etc. Called at
0134-0138	Disk BASIC Commands		\$A910,\$975C,\$8AFA,\$8162 Set to
0139-013C	Disk BASIC Functions		\$C29A by Disk
	Address for USR0	01A3-01A5	Tokenize Called at \$B821/Set to
013E-013F	Address for USR1	01110-01110	\$8304 by Extended
0140-0141		SOOD DEED	Extended BASIC ROM
0142-0143	Address for USR2	8000-9FFF	
0144-0145	Address for USR3	01D1	Tape File Length
0146-0147	Address for USR4	01D2-01D9	Tape File Name
0148-0149	Address for USR5	01DA-02D8	Cassette Buffer
014A-014B	Address for USR6	01DA-01E1	CLOADM File Name
014C-014D -	Address for USR7	01E^-01E6	EXEC Address from Tape

TRS-80C			
01E7-01E8	Load Address from Tape	94A1	Draw Line
02DC	Contains token for first keyword in	94E2	The Draw Line Loop
1 1	BASIC Statement	950 6	Move Up, Down, Left, Right Routines
102DD-03DC	Console I/O Buffer	95 32	PCLS
0400-05FF	Lo-res screen	9546	COLOR
0600-35FF	Posible Graphic Screens	9621	PMODE
0600	Bottom of program area/No Disk	9670	SCREEN
0600-06FF	Disk Buffer	968B	PCLEAR
0700-07FF	Disk Buffer	9710	Compare Two Points
0800-0927	Drive Table	9723	PCOPY
097E	Table of Current Tracks	9755	GET
0982	NMI in use flag	9758	PUT
0983	NMI JMP	98EC	PAINT
	Motor shutoff counter	9A22	PLAY
0985	Current latch data	9CB6	DRAW
0986	Program Start/Disk System	9E9D	CIRCLE
0C00		A000-BFFF	BASIC ROM
OFFF	Top of memory (4K)	A000-B111	Address of Check Keyboard
3FFF	Top of memory (16K)	A000-A001 A002-A003	Address of Character Out
7FFF	Top of memory (32K)	A002-A005	Address of Cassette Read On
8000-9FFF	Extended BASIC ROM	A004-A005 A006-A007	Address of Block In
807F	Cold Start to BASIC without	·	Address of Block-Out
1 1	size Search and Workspace init:	A008-A009	Address of Joystick In
	Resets pointers to Start of BASIC	AOOA-AOOB	Address of Header Out
1 60	Program	A00C-A00D	
80C0	Warmstart to BASIC. Does not Reset	A00E	Secondary Reset
	Pointers to Start of BASIC Prog	A027	- Primary Reset
8183-81EF	Extended Command Token Table	A06E	Hardstart (After Reset)
81F0-821D	Subroutine Entry Addresses	A0A6	Check for Disk ROM
821E-8256	Extended Function Token Table	A0CB	Check for Extended ROM
8257-8272	Subroutine Entry Addresses	A0D7	Print Version
J82B9	Break or Stop Routine	AOE8	Softstart (After Reset)
82BB	Extended interpret loop	AOF6	FIRQ Entry (ROM Pack Check)
8378	COSine	A10D	Start of Area Downloaded to RAM
8381	TANgent		at \$8F
8380	ArcTaNgent	A129_	Start of Area Downloaded to RAM
8446	LOG		at \$10C
8480	SQuare Root	A171	Input Character, Bit 7 Clear
84F2	EXPonential	A176	Input Character
8524	FIX	A199	Blink Cursor Color
8533	EDIT	AlBl	Wait for Keypress and Read Kybd;
86A7	TRace ON		Char Returned in A Register
86A8	TRace OFF	A1C1	Check Keyboard and Get Key if
86AC	POSition		pressed; Z=1,A=0 if no key
86BE	VARiable PoinTeR		Z=0,A=key, B and X Preserved
874E	STRING\$	126E	Table of Codes for non-alpha keys
	INSTRING	A26E	Output Character to Device Specified
877E	DEFine	A282	by \$6F, All But CC Preserved
8871	TIMER	ions	
8968	DELete	A2BF	Output Character in A to Printer
8970	RENUMber		(RS232)
8A09	HEX\$	A30A	Output Character in A to Screen
8BDD		A390	Input Line from Keyboard into Buffer
8C18	DownLOAD		at \$02DD; Return X\$02DC; Zero
8DBC	Input Serial Character Output Serial Character		byte at End of Buffer
8E06		. A416	CLOSE
928F	Find Byte/Bit Routine	A44C	CSAVE
92A6	Byte/Bit; PMODES 0,2,4	A46C	Perform CSAVEM Function, Requires
92C2	Byte/Bit; PMODES 1,3		Start of Memory Block in \$19-A0 and
) 92DD	Bit Tables		in \$01E7-8, Transfer Address in
9339	PPOINT	77-01-1	\$01E5-6, and File Name in \$01D2-9.
9361	PSET	· ·	Enter with $A=2$ and $X=0$.
9365	PRESET	A498	CLOAD
93BB	LINE	A4FE	CLOADM
9444	Draw Horizontal Line	A53E	EXEC
946C	Draw Vertical Line	<u></u>	

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A 5 6 A	INKEY\$		Address, \$45-6 is Destination Bottom
A564	Transfer Block	· -	Address after Move, \$47-8 is Source
A59A	EOF		Bottom Address
A5CE	** - *	AC46	Error Handler
A5EC	SKIPF	AC73	Idle Loop
A5F6	OPEN		NEW (Clear Memory)
Λ629	Open Tape File	AD17	
A681	Find Filename	AD19	Execute NEW
A6FE	Blink Screen Comer	AD47	FOR
A701	READ Block from Tape	AD9E	Interpret Loop
A70B	Read a Block from Cassette; Must be	ADC6	Execute line
:	On and In Bit Sync. \$7C Contains	ADE4	RESTORE
	File Block Type:0 = File Header,	ADEB	Check for Break or Pause
	1 = data, \$FF = EOF. \$7D Contains	AE02	END
! .	Number of Data Bytes in File	AE09	STOP 100
,	(0-\$FF). $Z=1$, $A=0$ if no Errors,	AE30	CONTinue
1	Z=0, $A=1$ if Checksum Error, $Z=0$,	AE41	CLEAR
}	A = 2 if Memory Error. X = Buffer	AE75	RUN WAS
,	Start Block Length if no Error, X	AE86	GO (3-3)
	Points to Beyond Bad Address if	AE92	GOSUB
! '	Error. U and Y Preserved	AEA4	GOTO
1.776			RETURN
A77C	Start Cassette and Get Into Bit Sync	AECO	DATA
Į.	for Reading. U and Y Preserved, FIRQ	AEEO	•
	and IRQ Masked.	AEE3	REM or !
A7BD	MOTOR	AEE8	ELSE
A7D8	Turn Cassette On and Write Leader	AF14	IF 12
A7E5	Write Tape File	AF42: 12	ON
A7E9	Turn Off Motor	AF67	Get Unsigned Integer
A7F4	Write Block to Cassette; Tape to	AF89	LET (a)
	Speed and Leader Written, \$7E=	AFF5	INPUT
	Buffer Address, \$7C = Block Type,	B046	READ
· ·	\$7D = Number of Data Bytes,	BOF8	NEXT (
<u>.</u>	X = Buffer Address Data Bytes, All	B156	Get Expression
	Registers Modified	B1CB	Another Entry in Operation Table
A85C	Sine Table for Cassette Out	B223	Get Operand
A880	SET	B290	Execute Functions
A8B1 .	RESET	B2D4 ·	AND/OR Operations
A8F5	POINT	B2F4	Relational Operations
A910	CLS	B34E	DIMension
A928	Clear Screen and Home Cursor	B38F	Variable Creation
A937	Print Copyright (CLS 9)	B3E4 1.1	Evaluate Integer Expression
A94B	SOUND	B3ED	Convert Number in FPAC into 16-bit
A956	Generate Sound		Two's Complement Integer Left in D
A992	AUDIO	:	Register; Overflow, return to BASIC
A9B3	Interrupt Processor (60 Hz Counter)		if > + 32767 or <-32768
A9C6	JOYSTICK	B4EE : 1	MEM
A9DE	Read and Store Joystick Values;	B4FD	STR\$
1,7,0,0	Left:Up/Down is \$15A,Rt/Lft is	B518	Get String
1	\$15B; Right:Up/Down is \$15C,Rt/	B56D	Allocate string routine
1	Lft is \$15D. Y is Preserved	B591	Garbage Collect
AA20 -	Function Address Table	B5D8	Process one descriptor
AA29	_		Compact one string
AA51	Operation Table for +, -, *, /,	BSEF	
	AND, OR (3 bytes each-Addresses and	B6°1	LEN
1,,,,	Precedence Values	B68C	CHR\$
AA66	Command Name Table	B6A0	ASC
AB1A	Function Name Table	B6AB	LEFTS.
AB67	Command Address Table	B6C8	RIGHT\$
ABAF	Error Code Table	B6CF	MID\$
ABEI	Text Strings	B716	VAL
ABF9	Search Stack for GOSUB or FOR	B750	PEEK .
ACIE	Open up space in memory	B757	POKE
AC20	Move Block of Memory Starting at	B75E	LLIST Command
	Top; \$41-2 is Destination Top	B764	LIST Command
1	Address, \$43-4 is Source Top	B7C2	Untokeniz e
1	•	J	

BB21	==TRS-80C		
B821 Tokenize one word B827 Tokenize one word B827 Tokenize one word B827 Tokenize one word B827 TAB B97C Print Text String D175 BACKUP D175 B	R7F6	Untokenize one token	DO26 ISET
B892	1		.
B87F			I
B997E TAB B998C Print Text String B986C Print 1 Sex String B988 Start of Floating Point Routines- Rounding B989 Subtract from FPACI B9C2 Add to FPACI BAC3 Constant 1.0 BAC4 Multiply B877 Constant 1.0 BAC5 Constant 1.0 BAC5 Constant 1.0 BAC6 Move FPAC1 Display the Decimal Value in D B878 Constant 1.0 B879 Convert String to Floating Point B871 Convert String to Floating Point B871 Convert String to Floating Point BBC6 INTeger BBC7 Convert String to Floating Point BBC8 Series of 5 Byte Constants BBC9 Constant 2.5 BBC0 Constant 2.6 BBC0 Constant 2.6 BBC0 Constant 2.7 BBC1 Convert String to Floating Point BBC1 Convert String to Floating Point BBC2 Series of 4 Byte Constants BBC3 Series of 5 Byte Constants BBC4 BBC5 Series of 5 Byte Constants BBC6 Series of 5 Byte Constants BBC7 BBC0 Constant 2.6 BBC0 Constant 2.6 BBC0 Constant 2.7 BBC0 Constant 2.7 BBC1 BBC1 Convert String to Floating Point BC2 BBC1 Constants 2.7 BBC2 Series of 5 Byte Constants BBC3 Series of 5 Byte Constants BBC4 BBC5 Series of 5 Byte Constants BBC6 BBC0 Constants 2.7 BBC0 Constant 2.7 BBC0 Constant 2.7 BBC1 BBC1 Constants 2.7 BBC2 Series of 5 Byte Constants BBC2 BBC1 Constants 2.7 BBC2 BBC3 Series of 5 Byte Constants BBC4 BBC5 Series of 5 Byte Constants BBC6 BBC1 Constants 2.7 BBC0 Constant 2.7 BBC0 Constant 2.7 BBC1 BBC1 Constants 2.7 BBC1 BBC1 Constants 3.7 BBC2 BBC1 Constants 3.7 BBC2 BBC1 Constants 4.7 BBC3 Series of 5 Byte Constants BBC2 BBC1 Constants 4.7 BBC3 Series of 5 Byte Constants BBC4 BBC5 Series of 5 Byte Constants BBC1 BBC1 Constants 4.7 BBC2 BBC1 Constants 4.7 BBC2 BBC1 Constants 4.7 BBC2 BBC1 Constants 5.7 BBC2 BBC2 Series 0.7 BBC3 Series			
B99C			
B984			l
B984 Start of Floating Point Routines- Rounding Subtract from FPACI D66C D5KCON D66C D			
Rounding	1		
BBBB Subtract from FPAC1 BBC2 Add to FPAC1 BAC7 Two's Complement FPAC1 D6C5 Restore D6FB D6497 8 mscc D765 Read/Write sector D766 Read/W	Dy54		· ·
BBC2 Add to FPAC1 BAC5 Constant 1.0 BAC6 Multiply BB2F Move [X] to FPAC2 BB7D Constant 10.0 BB01 Divide BC6A Move FPAC1 to FFAC1 BC5F Move FPAC1 to FFAC1 BC6D Test FPAC1 for Zero and Sign BC7A SiGN BC7A SiGN BC7A SiGN BC7A SiGN BC7B DD19 Convert String to Floating Point BD10 Constants 99999999, 999999999999999999999999999	ROBO		
BAC5 Constant 1.0 D6DE Cet Status BAC5 Constant 1.0 D6DE D6PD D6197 8 msc D7D6D D6197 Sm sec D7D7D5 Read/Write sector BACA Multiply BB2F Move [X] to FFAC2 BB7D Constant 1.0 D7AA Bit Table for Drives BB7D D7AE D7AE NMI Handler BB7D RC7A SIGN BC93 ABSolute value BBC6 ABSOLUTE String to Floating Point BDB6 Constants 99999999, 9, 999999999, 1E09 BDCC D15slay the Decimal Value in D Register BDD2 Convert FFAC1 to ASCII BEC0 Constant 0.5 BEC1 Series of 4 Byte Constants BF1F RANDom BF7B SINe BF1F RANDom BF7B SINe BF1F RANDom BF7B SINe BF1B RANDOM BF7B			
BAC5 Constant 1.0 BACA Multiply BA2F Move [X] to FPAC2 BB7D Constant 10.0 BB91 Divide BC4A Move FPAC2 to FFAC1 BC5F Move FPAC1 to FFAC1 BC6D Test FPAC1 for Zero and Sign BC7A SiGN BC7A SiGN BC7A ABSolute value BC23 ABSolute value BC26 INTeger BD12 Convert String to Floating Point BDB6 Constants 99999999, 99999999999999 BCC Display the Decimal Value in D Register BDD9 Convert FPAC1 to ASCII BEC5 Series of 4 Byte Constants BEF1F RanNDom BF7B SINe BF8B Series of 5 Byte Constants BF7B Sine BF8B Sine BF8 Sine BF8 Sine BF8 Sine BF9 Sine BF8 Sine BF9 Sine BF8 Sine BF9 Sine BF9 Sine BF8 Sine BF9 Sine			
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BB91 Divide BCCA Move FPAC2 to FPAC1 BCSF Move FPAC2 to FPAC2 BCSF Move FPAC2 to FPAC2 BCSF Move FPAC2 to FPAC2 BCSF Move FPAC1 to FPAC2 BCSF Move FPAC1 to FPAC2 FF00-FFF9 I/O and Control FF00-FF99 I/O and Cont	BB7D	Constant 10.0	
BC4A Move FPAC2 to FPAC1 BC5F Move FPAC1 be FPAC1 BC6D Test FPAC1 for Zero and Sign BC7A SiGN BC93 ABSolute value BCEE INTeger BD12 Convert String to Floating Point BD86 Constants 999999999, 9999999999, 1E09 BDCC Display the Decimal Value in D Register BDD9 Convert FPAC1 to ASCII BEC0 Constant 0.5 BEC5 Series of 4 Byte Constants BFFB RANDom BFFB SiNe BFFB COnstants 2 pi, 0.25 BFC8 Series of 5 Byte Constants BFFB Interrupt and Reset Vectors BBF2-BBF3 SWI2 BBF4-BBF5 SWI2 BBF4-BBF5 SWI2 BBF4-BBF5 SWI2 BBF4-BBF7 FIRQ BBF8-BBF8 SWI1 BBF6-BBF7 FIRQ BBF8-BBF8 SWI1 BBF6-BBF7 RESET C000-D7FF Disk BASIC ROM C004 Address of DSKCON C0D4 Warm Start to Disk BASIC, C17F-C1DA Disk Command Token Table C1DB-C200 Disk Subroutine Addresses CAC2 CKILL C932 SAVE C998 MERGE C99A LOAD CBCF DIRectory CDIA CVN C17BR MKNS C1336 LOC CD5B LOF CDCO FREE CTDP9 DRIVE CF3F RENAME CF3A WAITE CF60 Bit 0-Keyboard Row 1 and Right joystick switch Bit 1-Ryoboard Row 2 and Left joystick switch Bit 1-Ryoboard Row 2 and Left joystick switch Bit 1-Ryoboard Row 3 Bit 1-Ryoboard Row 3 Bit 1-Ryoboard Row 3 Bit 1-Ryoboard Row 4 Bit 1-Keyboard Row 3 Bit 3-Keyboard Row 4 Bit 1-Keyboard Row 4 Bit 1-Keyboard Row 3 Bit 3-Keyboard Row 4 Bit 1-Keyboard Row 4 Bit 1-Keyboard Row 3 Bit 3-Keyboard Row 4 Bit 1-Ryoboard Row 4 Bit 1-Ryoboard Row 4 Bit 1-Ryoboard Row 4 Bit 1-Ryoboard Row 5 Bit 1-Sexphoard Row 5 Bit 1-Sexphoard Row 6 Bit 1-Ryoboard Row 1 Bit 1-Ryoboard Row 2 and Left joystick switch Bit 1-Ryoboard Row 4 Bit 1-Ryoboard Row 5 Bit 1-Ryoboard Row 6 Bit 1-Ryoboard Row 1 Bit 1-Ryoboard Row 1 Bit 1-Ryoboard Row 1 Bit 1-Ryoboard Row	BB91	Divide	
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BC7A SIGN BC93 ABSolute value BCEE INTeger BD12 Convert String to Floating Point BDB6 Constants 99999999, 999999999, BDCC Display the Decimal Value in D Register BDD9 Convert FPAC1 to ASCII BEC0 Constant 0.5 BEC5 Series of 4 Byte Constants BF1F RANDom BF7B SINe BFBD Constants 2 pi, 0.25 BFC8 Series of 5 Byte Constants BFF2 Interrupt and Reset Vectors BBF2-BBF3 SW13 BBF4-BBF5 SW12 BBF6-BBF7 FIRQ BBF8-BBF9 IRQ BBF8-BBF9 IRQ BBF8-BBF9 IRQ BBF8-BBF9 IRQ BBF8-BBF9 RSSIT BBFC-BBFD NMI BBFE-BBFF RESET C000-D7FF Disk BASIC ROM C004 Address of DSKCON C0D4 Warm Start to Disk BASIC C17F-C1DA Disk Command Token Table C17B-C200 Disk Subroutine Addresses C4C2 C4C2 KILL C932 SAVE C98B MERCE C99A LOAD CBCF DIRectory CD1A CVN CD28 MKNS CD36 LOC CD5B LOP CDC0 FREE CDE9 DRIVE CT3F RENAME CF3F RENAME BTC EST CONSTITUTE THE ABILL 145 Bit 1-Keyboard Row 2 and Left ioystick switch Bit 1-Keyboard Row 3 Bit 1-Keyboard Row 4 Bit 1-Keyboard Row 4 Bit 1-Keyboard Row 4 Bit 1-Keyboard Row 6 Bit 7-Reyboard Row 6 Bit 6-Keyboard Row 6 Bit 6-Keyboard Row 6 Bit 6-Keyboard Row 6 Bit 6-Keyboard Column 1 Bit 1-Reyboard Column 2 Bit 3-SEL 1: LSB of the two analog MUX Select lines Bit 1-Interrupt input Invertigation of the Horizontal sync interrupt flag Bit 1-Keyboard Column 2 Bit 3-SEL 1: LSB of the two analog MUX Bit 1-Keyboard Column 4 Bit 4-Keyboard Column 5 Bit 1-Keyboard Column 6 Bit 6-Keyboard Column 7 Bit 1-Keyboard Column 6 Bit 6-Keyboard Column 1 Bit 1-Keyboard Column 1 Bit 1-Keyboard Column 6 Bit 1-Interrupt input Bit 1-Keyboard Column 6 Bit 1-Interrupt input Bit 1-Keyboard Column 6 Bit 1-Interrupt input Bit 1-Keyboard Column 6 Bit 6-Keyboard Column 7 Bit 1-Keyboard Column 8 Bit 1-Keyboard Column 1 Bit 1-Keyboard Column 6 Bit 1-Interrupt input Bit 1-Keyboard Column 6 Bit 1-Keyboard Column 6 Bit 1-Keybo			
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BD12 Convert String to Floating Point BD16 Constants 9999999, 9, 99999999, BDCC Display the Decimal Value in D Register BDD9 Convert FPAC1 to ASCII BECO Constant 0.5 BECO Constant 0.5 BEIF RayDom BFIF BBIF O-Control of the Horizontal Sync clock 16.567 MS BFI 1-Fibrierrupt input BFIF LayDom BFI	BC93		
BD12 Convert String to Floating Point BD86 Constants 99999999, 9, 999999999999 BDCC Display the Decimal Value in D Register BDD9 Convert FPAC1 to ASCII BECO Constant 0.55 BEC5 Series of 4 Byte Constants BF1F RaNDom BF78 SINe BFBD Constants 2 pi, 0.25 BFC8 Series of 5 Byte Constants BFF2 Interrupt and Reset Vectors BBF2-BBF3 SW13 BBF4-BBF5 SW12 BBF4-BBF5 SW12 BBF6-BBF7 FIRQ BBF8-BBF9 IRQ BBF8-BBF9 IRQ BBF8-BBF9 IRQ BBF8-BBF9 RESET C000-D7FF Disk BASIC ROM C004 Address of DSKCON C004 Warm Start to Disk BASIC C17F-C1DA Disk Command Token Table C1DB-C200 Disk Subroutine Addresses C6C2 KILL C932 SAVE C99A LOAD CBCP DIRectory CD1A CVN CD28 MKNS CD36 LOC CD5B LOF CDC0 FREE CDE9 DRIVE CF5F RENAME CF6C FIELD BIT 2-Keyboard Row 3 Bit 3-keyboard Row 5 Bit 4-Keyboard Row 5 Bit 4-Keyboard Row 7 Bit 7-Joystick comparison input FF01 Bit 0-Control of the Horizontal sync clock(63.5 microsec) Bit 1-;interrupt input selection register Bit 3-SEL 1: LSB of the two analog MUX select lines Bit 3-Keyboard Column 1 Bit 1-Keyboard Column 1 Bit 1-Keyboard Column 1 Bit 1-Keyboard Column 1 Bit 1-Keyboard Column 3 Bit 3-Keyboard Column 4 Bit 4-Keyboard Column 1 Bit 1-Keyboard Column 1 Bit 1-Keyboard Column 1 Bit 1-Keyboard Column 1 Bit 1-Keyboard Column 3 Bit 3-Keyboard Column 6 Bit 6-Keyboard Column 7 Bit 7-Keyboard Column 8 Bit 3-Keyboard Column 1 Bit 1-Keyboard Column 1 Bit 1-K	BCEE		
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BDCC Display the Decimal Value in D Register BDD9 Convert FPAC1 to ASCII BECO Constant 0.5 BEC5 Series of 4 Byte Constants BFIF RANDom BFF8 SINe BFBD Constants 2 pi, 0.25 BFC8 Series of 5 Byte Constants BFF2 Interrupt and Reset Vectors BBF2-BBF3 SWI3 BBF4-BBF5 SWI2 BBF4-BBF5 SWI2 BBF6-BBF7 FIRQ BBF8-BBF9 IRQ BBF8-BBF9 IRQ BBF8-BBF9 IRQ BBF8-BBFF RSST SWI1 BBFC-BBFD NMI BBFC-BBFD NMI BBFC-BBFT NMI BBFC-BBFT Disk BASIC ROM CO04 Address of DSKCON CO04 Warm Start to Disk BASIC C17F-C1DA Disk Subroutine Addresses C1DB-C200 Disk Subroutine Addresses C1DB-C200 Disk Subroutine Addresses C1DB-C200 Disk Subroutine Addresses C99A LOAD CBCF DIRectory CD1A CVN CD28 MKNS CD36 LOC CD5B LOF CDC0 FREE CDE9 DRIVE CFBA WRITE CFBO FIELD Bit 4-Keybaard Row 5 Bit 6-Keybaard Row 6 Bit 6-Keybaard Row 7 Bit 7-Josptick comparison input Bit 1-Seybaard Color of the Horizontal Sync clock (64,63.5 microsec) Bit 2-Normally 1 0 = Changes FF00 to data direction register Bit 3-SEL 1: LSB of the two analog MUX Select lines Bit 4-I Always Bit 4-Keybaard Column 1 Bit 4-Keybaard Column 4 Bit 4-Keybaard Column 5 Bit 3-Keybaard Column 6 Bit 4-Keybaard Column 6 Bit 4-Keybaard Column 7 Bit 7-Keybaard Column 6 Bit 4-Keybaard Column 6 Bit 4-Keybaard Column 7 Bit 7-Keybaard Column 7 Bit 7-Keybaard Column 8 BF03 Bit 0-Control of the field Sync clock 16.667 MS Bit 1-Jinterrupt input Bit 2-Normally 1 0 = changes FF02 to data direction register BF03 Bit 0-Control of the field Sync clock 16.667 MS Bit 3-SEL 2 MSB of the two analog MUX Bit 4-I Always Bit 5-1 Always Bit 6-Not used Bit 7-Feld Sync interrupt flag BF0-FERS BF1 BF1 Bit 1-Keybaard Column 6 Bit 4-Keybaard Column 7 Bit 7-Keybaard Column 7 Bit 7-Keybaard Column 7 Bit 7-Keybaard Column 8 BF0-FERS BF03 BF0-FERS BF1 BF03 Bit 0-Control of the field Sync clock 16.667 MS BIT 1-FERS BF1 BF1 BF1 BF1 Bit 1-Keybaard Column 8 BF1 Bit 1-Keybaard Column 8 BF1 Bit 1-Keybaard Column 19 BF1 Bit 1-Ke	BDB6		
BDCC Display the Decimal Value in D Register BDD9 Convert FPAC1 to ASCII Bit 5-Keyboard Row 6 BIT Constant 0.5 BFIF RANDom BFFIF RANDom BFFO Constants 2 pi, 0.25 BFCS Series of 5 Byte Constants BFFP Interrupt and Reset Vectors BFFP Interrupt and Reset Vectors BFFP BFF BFF FFO Bit 2-Normally 1 0 = Changes FF00 to data direction register BFF0 BFF-BFF BFF BFF BFF BFF BFF BFF BFF BFF			
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CF8A WRITE CFEO FIELD Bit 6-Not used Bit 7-Feld sync interrupt flag	CDE9	DRIVE ·- ·- ·- ·-	·
CFEO FIELD Bit 7-Feld sync interrupt flag	CF3F	RENAME	
Creo Field	-	·	
D025 RSET FF20-FF23 FIA 04			
	D025	RSET	1720-FF25 FIA 04

Tokens for CoCo, Dragon 32 and MC - 10

HEX	DEC	COCO	DBL	DRAG	DBL -	MC - 10
	400	500	CCN	FOR	SGN	FOR
80	128	FOR	SGN	GO	INT	GOTO
81	129	GO		REM	ABS	GOSUB
82	130	REM	ABS	- HEM	POS	REM
83	131	FI OF	USR	FICE	RND	IF
84	132		RND	ELSE	SOR	DATA
85		123		DATA	LOG	PRINT
86			PEEK			
87				PRINT	SIN	
88				ON		
89	137			INPUT	COS	NEXT
8A		END		END		
88		NEXT		NEXT		
8C .	140		EOF	DIM	PEEK	
8D		READ		READ		
8E					STR\$	
8F		RESTORE			VAL	
90		RETURN				RETURN
91			POINT			
92		POKE		500000000000000000000000000000000000000		
93		CONT				
94	148	LIST	ATN	CONT		LIST
95	149		COS	LIST	HEX	
96	1000000	NEW		CLEAR		NEW
97		CLOAD		NEW		
98	152	CSAVE		DEF	MID\$	
99	100	OPEN	LOG	CLOAD		and the second s
- 9A		CLOSE	POS	CSAVE	INKEY\$	
9B	155	LLIST	SOR	OPEN	MEM	SET
9C	156	SET	HEX\$	CLOSE	VARPTR	
9D	157	RESET	VARPTR		INSTR	
9E	158	CLS	INSTR	e State of the sta	- TIMER	
9F	159	MOTOR	TIMER			
AO	160	SOUND				
A1	161		STRING\$			
A2	162	EXEC	CVN	SOUND		TO
A3	163	SKIPF	FREE	AUDIO		THEN
A4	164	TAB(LOC	EXEC		NOT
A5	165	TO	LOF	SKIPF		STEP
- A6	166	SUB	MKNS.	DEL		OFF
A7	167	THEN	- AS	EDIT		+ +
A8	168	NOT		TRON		子子, 原一体, 通过 对 对 对 可
A9	169	STEP		TROFF		
AA	170	OFF		LINE		
AB	171	+	19 70 14	PCLS		^
AC	172	-		PSET		AND
AD	173	3		PRESET		OR
AE	174	1-		SCREEN		>
AF	175	^		PCLEAR		=
ВО		AND		COLOR		<
B1		OR		CIRCLE		SGN
	178	>		PAINT		INT
- B3	179	= -		GET		ABS
B4		<	1 1 1	PUT		USR
B5	181	DEL		DRAW		RND
B6	182	EDIT		PCOPY		SQR
B7	183	TRON		PMODE		LOG
B8	184	TROFF		PLAY		EXP
B9	185	DEF		DLOAD		SIN
ВА	186	LET		RENUM		COS (Continued on next page)
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BB	187	LINE
BC	188	PCLS
BD	189	PSET
BE	190	PRESET
BF	191	SCREEN
CO	192	PCLEAR
C1	193	COLOR
C2	194	CIRCLE
C3	195	PAINT
C4	196	GET
C5	197	PUT
C6	198	DRAW
C7	199	
C8	200	PMODE
C9	201	PLAY
CA	202	
CB	203	RENUM
CC	204	SA FN
CD CD	205	USING
CE CE	206	
CF CF	207	DRIVE
D0 00	208	FIELD
D1 D1	209	FILES
D2 02	210	KILL KILL
D3 D3	211	LOAD
D4 D4	212	LSET
D5 D5	213	MERGE
D6 D6	214	RENAME
D7	215	RSET
D8 DA	216	SAVE
D9 05	217	WRITE
DA DA	218	VERIFY
DB DB		UNLOAD
DC DC	220	
DD TO	221	BACKUP
DE DE		COPY
DF E	223	
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The complete professional software system, that meets ALL provisions of the FORTH-79 Standard (adopted Oct. 1980). Compare the many advanced features of FORTH-79 with the FORTH you are now using, or plan to buy!

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FEATURES	OURS	UTHENS	
79-Standard system gives source portability. Professionally written tutorial & user manual Screen editor with user-definable controls. Macro-assembler with local labels. Virtual memory. Both 13 & 16-sector format. Multiple disk drives. Double-number Standard & String extensions. Upper/lower case keyboard input. LO-Res graphics. 80 column display capability Z-80 CP/M Ver. 2.x & Northstar also available Affordable!	YES YES YES YES YES		
Low cost enhancement option: Hi-Res turtle-graphics. Floating-point mathematics. Powerful package with own manual, 50 functions in all, AM9511 compatible.	YES		
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Information was gleaned from the following sources in addition to personal observation:

Color Computer News
The Rainbow
80 Micro
John Beckett
John Steiner
Ralph Tenny

John (Tony) Podraza 119 Adobe Circle Carpentersville IL 60110



